Dynamically allocate a variable

```
ptr 0012FF7C 0012FF7D 0012FF7E 0012FF7F
```

```
int main()
{
    // int *ptr = new int;
    int *ptr;
    ptr = new int;
    *ptr = 20;
    cout << *ptr << endl;
    cout << ptr << endl << endl;
    del ete ptr;
}</pre>
```

Output

```
ptr 00480060 0012FF7D 00480060 00480061 00480062 0012FF7F 00480063
```

```
int main()
{
    // int *ptr = new int;
    int *ptr;
    ptr = new int;
    *ptr = 20;
    cout << *ptr << endl;
    cout << ptr << endl;
    del ete ptr;
}</pre>
```

```
int main()
{
    // int *ptr = new int;
    int *ptr;
    ptr = new int;
    *ptr = 20;
    cout << *ptr << endl;
    cout << ptr << endl;
    del ete ptr;
}</pre>
```

```
int main()
{
    // int *ptr = new int;
    int *ptr;
    ptr = new int;
    *ptr = 20;
    cout << *ptr << endl;
    cout << ptr << endl;
    del ete ptr;
}</pre>
```

Output

```
int main()
{
    // int *ptr = new int;
    int *ptr;
    ptr = new int;
    *ptr = 20;
    cout << *ptr << endl;
    cout << ptr << endl << endl;
    del ete ptr;
}</pre>
```

Output

00480060

```
ptr 00480060 0012FF7C 0012FF7D 0012FF7E 0012FF7F
```

```
int main()
{
    // int *ptr = new int;
    int *ptr;
    ptr = new int;
    *ptr = 20;
    cout << *ptr << endl;
    cout << ptr << endl;
    del ete ptr;
}</pre>
```

Output

Dynamically allocate an array - Fibonacci numbers

```
fib 0012FF78 number 0012FF7C
```

```
int main()
{
  int number;
  cin >> number;
  int *fib = new int[ number ];
  fib[0] = 1;
  fib[1] = 1;
   for( int i = 2; i < number; i ++ )
      fib[i] = fib[i-2] + fib[i-1];
   for (int i = 0; i < number; i++)
     cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
fib 0012FF78 number 0012FF7C
```

```
int main()
{
  int number;
   cin >> number;
   int *fib;
   fib = new int[ number ];
   fib[0] = 1;
   fib[1] = 1;
   for( int i = 2; i < number; i ++ )
      fib[i] = fib[i - 2] + fib[i - 1];
   for( int i = 0; i < number; i ++ )
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
      fib
      0012FF78

      number
      5
      0012FF7C
```

```
int main()
{
  int number;
   cin >> number;
   int *fib;
   fib = new int[ number ];
   fib[0] = 1;
   fib[1] = 1;
   for( int i = 2; i < number; i ++ )
      fib[i] = fib[i - 2] + fib[i - 1];
   for( int i = 0; i < number; i ++ )
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
fib
                       0012FF78
    number
                5
                       0012FF7C
                                                    00491DE0
                                                    00491DE4
int main()
                                                    00491DE8
  int number;
                                                    00491DEC
   cin >> number:
                                                    00491DF0
   int *fib;
   fib = new int[ number ];
   fib[0] = 1;
   fib[1] = 1;
   for( int i = 2; i < number; i ++ )
```

fib[i] = fib[i - 2] + fib[i - 1];

for(int i = 0; i < number; i++)

cout << fib[i] << endl;</pre>

del ete[] fi b;

```
00491DE0 | 0012FF78
       fib
                       0012FF7C
    number
                5
                                      fi b[0]
                                                    00491DE0
                                      fib[1]
                                                    00491DE4
int main()
                                      fib[2]
                                                    00491DE8
   int number;
                                      fib[3]
                                                    00491DEC
   cin >> number:
                                      fib[4]
                                                    00491DF0
   int *fib;
   fib = new int[ number ];
   fib[0] = 1;
   fib[1] = 1;
   for (int i = 2; i < number; i++)
      fib[i] = fib[i - 2] + fib[i - 1];
   for( int i = 0; i < number; i ++ )
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
00491DE0 | 0012FF78
       fib
                       0012FF7C
    number
                5
                                      fi b[0]
                                                    00491DE0
                                      fib[1]
                                                1
                                                    00491DE4
int main()
                                      fib[2]
                                                    00491DE8
   int number;
                                      fib[3]
                                                    00491DEC
   cin >> number:
                                      fib[4]
                                                    00491DF0
   int *fib;
   fib = new int[ number ];
   fib[0] = 1;
   fib[1] = 1;
   for (int i = 2; i < number; i++)
      fib[i] = fib[i - 2] + fib[i - 1];
   for( int i = 0; i < number; i ++ )
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
00491DE0 | 0012FF78
       fib
                       0012FF7C
    number
                5
                                      fi b[0]
                                                    00491DE0
                                      fib[1]
                                                1
                                                    00491DE4
int main()
                                                2
                                      fib[2]
                                                    00491DE8
   int number;
                                      fib[3]
                                                    00491DEC
   cin >> number:
                                      fib[4]
                                                    00491DF0
   int *fib;
   fib = new int[ number ];
   fib[0] = 1;
   fib[1] = 1;
   for (int i = 2; i < number; i++)
      fib[i] = fib[i - 2] + fib[i - 1];
   for( int i = 0; i < number; i ++ )
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
00491DE0 | 0012FF78
       fib
                       0012FF7C
    number
                5
                                      fi b[0]
                                                    00491DE0
                                      fib[1]
                                                1
                                                    00491DE4
int main()
                                                2
                                      fib[2]
                                                    00491DE8
   int number;
                                                3
                                                     00491DEC
                                      fib[3]
   cin >> number:
                                      fib[4]
                                                    00491DF0
   int *fib;
   fib = new int[ number ];
   fib[0] = 1;
   fib[1] = 1;
   for (int i = 2; i < number; i++)
      fib[i] = fib[i - 2] + fib[i - 1];
   for( int i = 0; i < number; i ++ )
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
00491DE0 | 0012FF78
       fib
                       0012FF7C
    number
                5
                                      fi b[0]
                                                     00491DE0
                                      fib[1]
                                                1
                                                     00491DE4
int main()
                                                2
                                      fib[2]
                                                     00491DE8
{
   int number;
                                                3
                                                     00491DEC
                                      fib[3]
   cin >> number:
                                                5
                                      fib[4]
                                                     00491DF0
  int *fib;
   fib = new int[ number ];
   fib[0] = 1;
   fib[1] = 1;
   for (int i = 2; i < number; i++)
      fib[i] = fib[i - 2] + fib[i - 1];
   for( int i = 0; i < number; i ++ )
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
        fib
        00491DE0
        0012FF78

        number
        5
        0012FF7C
```

```
int main()
{
  int number;
   cin >> number;
  int *fib;
  fib = new int[ number ];
  fib[0] = 1:
  fib[1] = 1;
   for( int i = 2; i < number; i ++ )
      fib[i] = fib[i - 2] + fib[i - 1];
   for( int i = 0; i < number; i ++ )
      cout << fib[ i ] << endl;
   del ete[] fi b;
```

Passing dynamically allocated arrays to functions

```
int main()
   int n;
   cout << "Enter a positive number ( 2 - 46 ): ";</pre>
   cin >> n;
   int *fib = new int[ n ];
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[i] << endl;</pre>
   del ete [] fib;
}
void fibonacci( int n, int *f )
   f[0] = 1;
   f[1] = 1;
   for( int i = 2; i < n; i++ )
      f[i] = f[i-2] + f[i-1];
}
```

```
int main()
{
   int n;
   cout << "Enter a positive number ( 2 - 46 ): ";</pre>
   cin >> n:
   int *fib = new int[ n ];
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
}
void fibonacci( int n, int *f )
{
  f[0] = 1;
  f[1] = 1;
   for( int i = 2; i < n; i++)
      f[i] = f[i - 2] + f[i - 1];
}
```

```
i 0012FF74
fib 0012FF78
n 5 0012FF7C
```

```
void fibonacci( int n, int *f )
                 f[0] = 1;
                  f[1] = 1;
                  for (int i = 2; i < n; i++)
int main()
                     f[i] = f[i - 2] + f[i - 1];
{
   int n;
   cin >> n;
   int *fib = new int[ n ];
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
fib[0]
                                                             00491D90
  i
               0012FF74
fib
                                               fib[1]
     00491D90
              0012FF78
                                                             00491D94
               0012FF7C
                                               fib[2]
                                                             00491D98
        5
  n
                                               fib[3]
                                                             00491D9C
                                               fib[4]
                                                             00491DA0
```

```
void fibonacci( int n, int *f )
                  f[0] = 1;
                  f[1] = 1;
                  for( int i = 2; i < n; i++)
int main()
                     f[i] = f[i - 2] + f[i - 1];
{
   int n;
   cin >> n;
   int *fib = new int[ n ];
   fibonacci (n, fib);
   for (int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
00491D90
                                              fib[0]
  i
               0012FF74
                                       f[0]
fib
                                              fib[1]
                                       f[1]
     00491D90
              0012FF78
                                                            00491D94
                                       f[2]
               0012FF7C
                                              fib[2]
                                                            00491D98
        5
  n
                                       f[3]
                                              fib[3]
                                                            00491D9C
                          0012FF0C
            i
                                              fib[4]
                                                            00491DA0
                                       f[4]
                          0012FF18
                   5
            n
            f
               00491D90
                         0012FF1C
               void fibonacci( int n, int *f )
                  f[0] = 1;
                  f[1] = 1:
                  for( int i = 2; i < n; i++)
int main()
                     f[i] = f[i - 2] + f[i - 1];
{
   int n;
   cin >> n;
   int *fib = new int[ n ];
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
00491D90
                                              fib[0]
  i
               0012FF74
                                       f[0]
fib
                                              fib[1]
                                       f[1]
     00491D90
              0012FF78
                                                            00491D94
                                       f[2]
               0012FF7C
                                              fib[2]
                                                            00491D98
        5
  n
                                       f[3]
                                              fib[3]
                                                            00491D9C
                          0012FF0C
            i
                                              fib[4]
                                                            00491DA0
                                       f[4]
                          0012FF18
                   5
            n
            f
               00491D90
                         0012FF1C
               void fibonacci( int n, int *f )
                  f[0] = 1;
                  f[1] = 1:
                  for( int i = 2; i < n; i++)
int main()
                     f[i] = f[i - 2] + f[i - 1];
{
   int n;
   cin >> n;
   int *fib = new int[ n ];
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
fib[0]
                                                            00491D90
  i
               0012FF74
                                       f[0]___
                                                        1
                                              fib[1]
fib
                                       f[1]
     00491D90
              0012FF78
                                                        1
                                                            00491D94
                                       f[2]
               0012FF7C
                                              fib[2]
                                                            00491D98
        5
  n
                                       f[3]
                                              fib[3]
                                                            00491D9C
                          0012FF0C
             i
                                              fib[4]
                                                            00491DA0
                                       f[4]
                          0012FF18
                   5
             n
             f
               00491D90
                         0012FF1C
               void fibonacci( int n, int *f )
                  f[0] = 1;
                  f[1] = 1:
                  for( int i = 2; i < n; i++)
int main()
                     f[i] = f[i - 2] + f[i - 1];
{
   int n;
   cin >> n;
   int *fib = new int[ n ];
   fibonacci (n, fib);
   for (int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
fib[0]
                                                            00491D90
  i
               0012FF74
                                       f[0]___
                                                        1
                                              fib[1]
fib
     00491D90
                                       f[1]
              0012FF78
                                                        1
                                                            00491D94
                                       f[2]
               0012FF7C
                                              fib[2]
                                                            00491D98
        5
  n
                                       f[3]
                                              fib[3]
                                                            00491D9C
                          0012FF0C
             i
                   2
                                              fib[4]
                                                            00491DA0
                                       f[4]
                          0012FF18
                   5
             n
               00491D90
                         0012FF1C
             f
               void fibonacci( int n, int *f )
                  f[0] = 1;
                  f[1] = 1:
                  for( int i = 2; i < n; i++)
int main()
                     f[i] = f[i - 2] + f[i - 1];
{
   int n;
   cin >> n;
   int *fib = new int[ n ];
   fibonacci (n, fib);
   for (int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
fib[0]
                                                            00491D90
  i
               0012FF74
                                       f[0]___
                                                        1
fib
                                              fib[1]
                                       f[1]
                                                            00491D94
     00491D90
              0012FF78
                                                        1
                                              fib[2]
                                       f[2]
               0012FF7C
                                                        2
                                                            00491D98
        5
  n
                                       f[3]
                                              fib[3]
                                                            00491D9C
                          0012FF0C
             i
                   2
                                              fib[4]
                                                            00491DA0
                                       f[4]
                          0012FF18
                   5
             n
               00491D90
                         0012FF1C
             f
               void fibonacci( int n, int *f )
                  f[0] = 1;
                  f[1] = 1:
                  for( int i = 2; i < n; i++)
int main()
                     f[i] = f[i - 2] + f[i - 1];
{
   int n;
   cin >> n;
   int *fib = new int[ n ];
   fibonacci (n, fib);
   for (int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
fib[0]
                                                            00491D90
  i
               0012FF74
                                       f[0]___
                                                        1
fib
                                              fib[1]
                                       f[1]
                                                            00491D94
     00491D90
              0012FF78
                                                        1
                                              fib[2]
                                       f[2]
               0012FF7C
                                                        2
                                                            00491D98
        5
  n
                                       f[3]
                                              fib[3]
                                                            00491D9C
                          0012FF0C
             i
                   3
                                              fib[4]
                                                            00491DA0
                                       f[4]
                          0012FF18
                   5
             n
               00491D90
                         0012FF1C
             f
               void fibonacci( int n, int *f )
                  f[0] = 1;
                  f[1] = 1:
                  for( int i = 2; i < n; i++)
int main()
                     f[i] = f[i - 2] + f[i - 1];
{
   int n;
   cin >> n;
   int *fib = new int[ n ];
   fibonacci (n, fib);
   for (int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
fib[0]
                                                            00491D90
  i
               0012FF74
                                       f[0]___
                                                        1
fib
                                              fib[1]
                                       f[1]
                                                            00491D94
     00491D90
              0012FF78
                                                        1
                                       f[2]
               0012FF7C
                                              fib[2]
                                                        2
                                                            00491D98
        5
  n
                                              fib[3]
                                       f[3]
                                                        3
                                                            00491D9C
                          0012FF0C
             i
                   3
                                              fib[4]
                                                            00491DA0
                                       f[4]
                          0012FF18
                   5
             n
               00491D90
                         0012FF1C
             f
               void fibonacci( int n, int *f )
                  f[0] = 1:
                  f[1] = 1:
                  for( int i = 2; i < n; i++)
int main()
                     f[i] = f[i - 2] + f[i - 1];
{
   int n;
   cin >> n;
   int *fib = new int[ n ];
   fibonacci (n, fib);
   for (int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
fib[0]
                                                            00491D90
  i
               0012FF74
                                       f[0]___
                                                        1
fib
                                              fib[1]
                                       f[1]
                                                            00491D94
     00491D90
              0012FF78
                                                        1
                                       f[2]
               0012FF7C
                                              fib[2]
                                                        2
                                                            00491D98
        5
  n
                                              fib[3]
                                                            00491D9C
                                       f[3]
                                                        3
                          0012FF0C
             i
                                              fib[4]
                                                            00491DA0
                                       f[4]
                          0012FF18
                   5
             n
               00491D90
                         0012FF1C
             f
               void fibonacci( int n, int *f )
                  f[0] = 1;
                  f[1] = 1:
                  for( int i = 2; i < n; i++)
int main()
                     f[i] = f[i - 2] + f[i - 1];
{
   int n;
   cin >> n;
   int *fib = new int[ n ];
   fibonacci (n, fib);
   for (int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
fib[0]
                                                            00491D90
  i
               0012FF74
                                       f[0]___
                                                        1
fib
                                              fib[1]
                                       f[1]
                                                            00491D94
     00491D90
              0012FF78
                                                        1
                                       f[2]
               0012FF7C
                                              fib[2]
                                                        2
                                                            00491D98
        5
  n
                                              fib[3]
                                       f[3]
                                                        3
                                                            00491D9C
                          0012FF0C
             i
                                              fib[4]
                                                        5
                                                            00491DA0
                                       f[4]
                          0012FF18
                   5
             n
               00491D90
                         0012FF1C
             f
               void fibonacci( int n, int *f )
                  f[0] = 1;
                  f[1] = 1:
                  for( int i = 2; i < n; i++)
int main()
                     f[i] = f[i - 2] + f[i - 1];
{
   int n;
   cin >> n;
   int *fib = new int[ n ];
   fibonacci (n, fib);
   for (int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
fib[0]
                                                             00491D90
  i
               0012FF74
                                                         1
                                               fib[1]
fib
                                                             00491D94
     00491D90
              0012FF78
                                                         1
                                               fib[2]
               0012FF7C
                                                         2
                                                             00491D98
         5
  n
                                               fib[3]
                                                         3
                                                             00491D9C
                                               fib[4]
                                                         5
                                                             00491DA0
```

```
void fibonacci( int n, int *f )
                  f[0] = 1;
                  f[1] = 1;
                  for( int i = 2; i < n; i++)
int main()
                     f[i] = f[i - 2] + f[i - 1];
{
   int n;
   cin >> n;
   int *fib = new int[ n ];
   fibonacci (n, fib);
   for (int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
i 0012FF74
fib 00491D90 0012FF78
n 5 0012FF7C
```

```
void fibonacci( int n, int *f )
                  f[0] = 1;
                  f[1] = 1;
                  for( int i = 2; i < n; i++)
int main()
                     f[i] = f[i - 2] + f[i - 1];
{
   int n;
   cin >> n;
   int *fib = new int[ n ];
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

Returns dynamically allocated arrays back to the calling function

```
int main()
   int n = 0;
   int *fib = nullptr;
   fibonacci( n, fib );
   for( int i = 0; i < n; i++)
      cout << fib[i] << endl;</pre>
   del ete [] fi b;
void fibonacci( int n, int *f )
   cout << "Enter a positive number ( 2 - 46 ): ";</pre>
   cin >> n;
   f = new int[n]
   f[0] = 1;
   f[1] = 1;
   for( int i = 2; i < n; i++ )
      f[i] = f[i-2] + f[i-1];
}
```

```
int main()
{
  int n = 0;
  int *fib = nullptr;
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;
   del ete[] fi b;
}
void fibonacci( int n, int *f )
  cout << "Enter a positive number ( 2 - 46 ): ";</pre>
   cin >> n;
  f = new int[n];
  f[0] = 1;
  f[1] = 1;
   for( int i = 2; i < n; i++)
     f[i] = f[i - 2] + f[i - 1];
}
```

```
fib
                0012FF78
         0
                0012FF7C
         0
  n
```

{

```
void fibonacci( int n, int *f )
                 cin >> n;
                  f = new int[n];
                  f[0] = 1;
                  f[1] = 1;
                 for( int i = 2; i < n; i++)
                     f[i] = f[i - 2] + f[i - 1];
int main()
   int n = 0;
   int *fib = nullptr;
   fibonacci( n, fib );
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
fib
               0012FF78
        0
               0012FF7C
        0
  n
                          0012FF0C
            i
                          0012FF18
                   0
            n
            f
                          0012FF1C
                   0
               void fibonacci( int n, int *f )
                  cin >> n;
                  f = new int[n];
                  f[0] = 1;
                  f[1] = 1;
                  for( int i = 2; i < n; i++)
                     f[i] = f[i - 2] + f[i - 1];
int main()
{
   int n = 0;
   int *fib = nullptr;
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
fib
               0012FF78
        0
               0012FF7C
        0
  n
                          0012FF0C
            i
                          0012FF18
                   5
            n
            f
                          0012FF1C
                   0
               void fibonacci( int n, int *f )
                  cin >> n;
                  f = new int[n];
                  f[0] = 1;
                  f[1] = 1;
                  for( int i = 2; i < n; i++)
                     f[i] = f[i - 2] + f[i - 1];
int main()
{
   int n = 0;
   int *fib = nullptr;
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
fib
               0012FF78
                                                f[0]
                                                            00491D90
        0
                                                f[1]
               0012FF7C
                                                            00491D94
        0
  n
                                                f[2]
                                                            00491D98
                          0012FF0C
            i
                                                f[3]
                                                            00491D9C
                          0012FF18
                   5
            n
                                                f[4]
                                                            00491DA0
            f
               00491D90
                         0012FF1C
               void fibonacci( int n, int *f )
                  cin >> n;
                  f = new int[n];
                  f[0] = 1;
                  f[ 1 ] = 1;
                  for (int i = 2; i < n; i++)
                     f[i] = f[i - 2] + f[i - 1];
int main()
{
   int n = 0;
   int *fib = nullptr;
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
fib
               0012FF78
                                                             00491D90
                                                 f[0]
        0
                                                         1
                                                 f[1]
               0012FF7C
                                                             00491D94
        0
                                                         1
  n
                                                 f[2]
                                                             00491D98
                          0012FF0C
             i
                                                 f[3]
                                                             00491D9C
                          0012FF18
                    5
             n
                                                 f[4]
                                                             00491DA0
             f
                00491D90
                         0012FF1C
               void fibonacci( int n, int *f )
                  cin >> n;
                   f = new int[n];
                   f[0] = 1;
                  \mathbf{f}[1] = 1;
                  for (int i = 2; i < n; i++)
                      f[i] = f[i - 2] + f[i - 1];
int main()
{
   int n = 0;
   int *fib = nullptr;
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
fib
               0012FF78
                                                            00491D90
                                                f[0]
        0
                                                        1
                                                f[1]
               0012FF7C
                                                            00491D94
        0
                                                        1
  n
                                                f[2]
                                                            00491D98
                   2
                          0012FF0C
            i
                                                f[3]
                                                            00491D9C
                          0012FF18
                   5
            n
                                                f[4]
                                                            00491DA0
             f
               00491D90
                         0012FF1C
               void fibonacci( int n, int *f )
                  cin >> n;
                  f = new int[n];
                  f[0] = 1;
                  f[ 1 ] = 1;
                  for (int i = 2; i < n; i++)
                     f[i] = f[i - 2] + f[i - 1];
int main()
{
   int n = 0;
   int *fib = nullptr;
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
fib
               0012FF78
                                                            00491D90
                                                f[0]
        0
                                                        1
                                                f[1]
               0012FF7C
                                                            00491D94
        0
                                                        1
  n
                                                f[2]
                                                            00491D98
                   2
                          0012FF0C
            i
                                                f[3]
                                                            00491D9C
                          0012FF18
                   5
            n
                                                f[4]
                                                            00491DA0
             f
               00491D90
                         0012FF1C
               void fibonacci( int n, int *f )
                  cin >> n;
                  f = new int[n];
                  f[0] = 1;
                  f[ 1 ] = 1;
                  for (int i = 2; i < n; i++)
                     f[i] = f[i - 2] + f[i - 1];
int main()
{
   int n = 0;
   int *fib = nullptr;
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
fib
               0012FF78
                                                 f[0]
                                                             00491D90
        0
                                                         1
                                                 f[1]
               0012FF7C
                                                             00491D94
        0
                                                         1
  n
                                                 f[2]
                                                         2
                                                             00491D98
                   2
                          0012FF0C
             i
                                                 f[3]
                                                             00491D9C
                          0012FF18
                    5
             n
                                                 f[4]
                                                             00491DA0
             f
                00491D90
                         0012FF1C
               void fibonacci( int n, int *f )
                  cin >> n;
                   f = new int[n];
                   f[0] = 1;
                  \mathbf{f}[1] = 1;
                  for (int i = 2; i < n; i++)
                      f[i] = f[i - 2] + f[i - 1];
int main()
{
   int n = 0;
   int *fib = nullptr;
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
fib
               0012FF78
                                                             00491D90
                                                 f[0]
        0
                                                         1
                                                 f[1]
               0012FF7C
                                                             00491D94
        0
                                                         1
  n
                                                 f[2]
                                                         2
                                                             00491D98
                   3
                          0012FF0C
             i
                                                 f[3]
                                                             00491D9C
                          0012FF18
                    5
             n
                                                 f[4]
                                                             00491DA0
             f
                00491D90
                         0012FF1C
               void fibonacci( int n, int *f )
                  cin >> n;
                   f = new int[n];
                   f[0] = 1;
                  \mathbf{f}[1] = 1;
                  for (int i = 2; i < n; i++)
                      f[i] = f[i - 2] + f[i - 1];
int main()
{
   int n = 0;
   int *fib = nullptr;
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
fib
               0012FF78
                                                f[0]
                                                            00491D90
        0
                                                f[1]
               0012FF7C
                                                            00491D94
        0
                                                       1
  n
                                                f[2]
                                                       2
                                                            00491D98
                   3
                          0012FF0C
            i
                                                f[3]
                                                       3
                                                            00491D9C
                          0012FF18
                   5
            n
                                                f[4]
                                                            00491DA0
            f
               00491D90
                         0012FF1C
               void fibonacci( int n, int *f )
                  cin >> n;
                  f = new int[n];
                  f[0] = 1;
                  f[1] = 1;
                  for (int i = 2; i < n; i++)
                     f[i] = f[i - 2] + f[i - 1];
int main()
{
   int n = 0;
   int *fib = nullptr;
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
fib
               0012FF78
                                                f[0]
                                                            00491D90
        0
                                                f[1]
               0012FF7C
                                                            00491D94
        0
                                                       1
  n
                                                f[2]
                                                       2
                                                            00491D98
                          0012FF0C
            i
                   4
                                                f[3]
                                                       3
                                                            00491D9C
                          0012FF18
                   5
            n
                                                f[4]
                                                            00491DA0
            f
               00491D90
                         0012FF1C
               void fibonacci( int n, int *f )
                  cin >> n;
                  f = new int[n];
                  f[0] = 1;
                  f[1] = 1;
                  for (int i = 2; i < n; i++)
                     f[i] = f[i - 2] + f[i - 1];
int main()
{
   int n = 0;
   int *fib = nullptr;
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
fib
               0012FF78
                                                f[0]
                                                            00491D90
        0
                                                f[1]
               0012FF7C
                                                            00491D94
        0
                                                       1
  n
                                                f[2]
                                                       2
                                                            00491D98
                          0012FF0C
            i
                   4
                                                f[3]
                                                       3
                                                            00491D9C
                          0012FF18
                   5
            n
                                                f[4]
                                                       5
                                                            00491DA0
            f
               00491D90
                         0012FF1C
               void fibonacci( int n, int *f )
                  cin >> n;
                  f = new int[n];
                  f[0] = 1;
                  f[1] = 1;
                  for (int i = 2; i < n; i++)
                     f[i] = f[i - 2] + f[i - 1];
int main()
{
   int n = 0;
   int *fib = nullptr;
   fibonacci (n, fib);
   for( int i = 0; i < n; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

```
fib
                0012FF78
         0
                0012FF7C
         0
  n
```

int main()

{

```
f[0]
            00491D90
f[1]
            00491D94
       1
f[2]
       2
            00491D98
f[3]
            00491D9C
       3
f[4]
       5
            00491DA0
```

```
void fibonacci( int n, int *f )
              cin >> n;
               f = new int[n];
               f[0] = 1;
               f[1] = 1;
              for (int i = 2; i < n; i++)
                  f[i] = f[i - 2] + f[i - 1];
int n = 0;
int *fib = nullptr;
fibonacci (n, fib);
for( int i = 0; i < n; i++)
   cout << fib[ i ] << endl;</pre>
del ete[] fi b;
```

```
int main()
{
   int num = 0;
   int *fib = nullptr;
   fibonacci ( num, fib );
   for (int i = 0; i < num; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
}
void fibonacci( int &n, int *&f )
   cout << "Enter a positive number ( 2 - 46 ): ";</pre>
   cin >> n;
   f = new int[n];
  f[0] = 1;
  f[1] = 1;
   for( int i = 2; i < n; i++)
      f[i] = f[i - 2] + f[i - 1];
}
```

```
      fib
      0
      0012FF78

      num
      0
      0012FF7C
```

cout << fib[i] << endl;</pre>

del ete[] fib;

```
void fibonacci( int &n, int *&f )
{
    cin >> n;
    f = new int[ n ];
    f[ 0 ] = 1;
    f[ 1 ] = 1;
    for( int i = 2; i < n; i++ )
        f[ i ] = f[ i - 2 ] + f[ i - 1 ];
}
int main()
{
    int num = 0;
    int *fib = nullptr;
    fibonacci( num, fib );
    for( int i = 0; i < num; i++ )</pre>
```

```
fib
  f
                      0012FF78
               0
                     0012FF7C
               0
  n
      num
                            0012FF0C
              i
                 void fibonacci (int &n, int *&f)
                    cin >> n;
                    f = new int[n];
                    \mathbf{f}[0] = 1;
                    f[ 1 ] = 1;
                    for( int i = 2; i < n; i++)
                       f[i] = f[i - 2] + f[i - 1];
int main()
   int num = 0;
   int *fib = nullptr;
   fibonacci ( num, fib );
   for (int i = 0; i < num; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
fib
  f
                      0012FF78
               0
                      0012FF7C
               5
  n
      num
                            0012FF0C
              i
                 void fibonacci (int &n, int *&f)
                    cin >> n;
                    f = new int[n];
                    \mathbf{f}[0] = 1;
                    f[ 1 ] = 1;
                    for( int i = 2; i < n; i++)
                       f[i] = f[i - 2] + f[i - 1];
int main()
   int num = 0;
   int *fib = nullptr;
   fibonacci ( num, fib );
   for (int i = 0; i < num; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
fib[0]
                                       f[0]
          00491D90
 f
     fib
                    0012FF78
                                       f[1]
                                              fib[1]
                     0012FF7C
                                       f[2]
                                              fib[2]
              5
 n
      num
                                       f[3]
                                             fib[3]
                           0012FF0C
              i
                                       f[4]
                                              fib[4]
                void fibonacci (int &n, int *&f)
                   cin >> n;
                   f = new int[n];
                   f[0] = 1:
                   f[1] = 1;
                   for (int i = 2; i < n; i++)
                      f[i] = f[i - 2] + f[i - 1];
int main()
   int num = 0;
   int *fib = nullptr;
   fibonacci ( num, fib );
   for (int i = 0; i < num; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

00491D94

00491D98

00491D9C

```
f[0]
                                              fib[0]
                                                       1
          00491D90
 f
     fib
                    0012FF78
                                       f[1]
                                              fib[1]
                                                       1
                     0012FF7C
                                       f[2]
                                              fib[2]
              5
 n
      num
                                       f[3]
                                             fib[3]
                           0012FF0C
              i
                                       f[4]
                                              fib[4]
                void fibonacci (int &n, int *&f)
                   cin >> n;
                   f = new int[n];
                   f[0] = 1:
                   f[1] = 1;
                   for (int i = 2; i < n; i++)
                      f[i] = f[i - 2] + f[i - 1];
int main()
   int num = 0;
   int *fib = nullptr;
   fibonacci ( num, fib );
   for (int i = 0; i < num; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

00491D94

00491D98

00491D9C

```
f[0]
                                              fib[0]
                                                        1
          00491D90
 f
     fib
                    0012FF78
                                       f[1]
                                              fib[1]
                                                        1
                     0012FF7C
                                       f[2]
                                              fib[2]
              5
 n
      num
                                       f[3]
                                              fib[3]
                           0012FF0C
                    2
                                       f[4]
                                              fib[4]
                void fibonacci (int &n, int *&f)
                   cin >> n;
                   f = new int[n];
                   f[0] = 1:
                   f[1] = 1;
                   for (int i = 2; i < n; i++)
                      f[i] = f[i - 2] + f[i - 1];
int main()
   int num = 0;
   int *fib = nullptr;
   fibonacci ( num, fib );
   for (int i = 0; i < num; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

00491D94

00491D98

00491D9C

```
f[0]
                                              fib[0]
                                                        1
          00491D90
 f
     fib
                    0012FF78
                                       f[1]
                                              fib[1]
                                                        1
                     0012FF7C
                                       f[2]
                                              fib[2]
                                                        2
              5
 n
      num
                                       f[3]
                                              fib[3]
                           0012FF0C
                    2
                                       f[4]
                                              fib[4]
                void fibonacci (int &n, int *&f)
                   cin >> n;
                   f = new int[n];
                   f[0] = 1:
                   f[1] = 1;
                   for (int i = 2; i < n; i++)
                      f[i] = f[i - 2] + f[i - 1];
int main()
   int num = 0;
   int *fib = nullptr;
   fibonacci ( num, fib );
   for (int i = 0; i < num; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

00491D94

00491D98

00491D9C

```
f[0]
                                               fib[0]
                                                        1
          00491D90
 f
     fib
                    0012FF78
                                       f[1]
                                              fib[1]
                                                        1
                     0012FF7C
                                       f[2]
                                              fib[2]
                                                        2
              5
 n
      num
                                       f[3]
                                              fib[3]
                           0012FF0C
              i
                    3
                                       f[4]
                                              fib[4]
                void fibonacci (int &n, int *&f)
                   cin >> n;
                   f = new int[n];
                   f[0] = 1:
                   f[1] = 1;
                   for (int i = 2; i < n; i++)
                      f[i] = f[i - 2] + f[i - 1];
int main()
   int num = 0;
   int *fib = nullptr;
   fibonacci ( num, fib );
   for (int i = 0; i < num; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

00491D94

00491D98

00491D9C

```
f[0]
                                               fib[0]
                                                        1
           00491D90
 f
     fib
                    0012FF78
                                       f[1]
                                              fib[1]
                                                        1
                     0012FF7C
                                       f[2]
                                              fib[2]
                                                        2
              5
 n
      num
                                              fib[3]
                                       f[3]
                                                        3
                           0012FF0C
              i
                    3
                                       f[4]
                                              fib[4]
                void fibonacci (int &n, int *&f)
                   cin >> n;
                   f = new int[n];
                   f[0] = 1:
                   f[1] = 1;
                   for (int i = 2; i < n; i++)
                      f[i] = f[i - 2] + f[i - 1];
int main()
   int num = 0;
   int *fib = nullptr;
   fibonacci ( num, fib );
   for (int i = 0; i < num; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

00491D94

00491D98

00491D9C

```
f[0]
                                               fib[0]
                                                        1
          00491D90
 f
     fib
                    0012FF78
                                       f[1]
                                              fib[1]
                                                        1
                     0012FF7C
                                       f[2]
                                              fib[2]
                                                        2
              5
 n
      num
                                              fib[3]
                                       f[3]
                                                        3
                           0012FF0C
              i
                                       f[4]
                                              fib[4]
                void fibonacci (int &n, int *&f)
                   cin >> n;
                   f = new int[n];
                   f[0] = 1:
                   f[1] = 1;
                   for (int i = 2; i < n; i++)
                      f[i] = f[i - 2] + f[i - 1];
int main()
   int num = 0;
   int *fib = nullptr;
   fibonacci ( num, fib );
   for (int i = 0; i < num; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

00491D94

00491D98

00491D9C

```
f[0]
                                              fib[0]
                                                        1
          00491D90
 f
     fib
                    0012FF78
                                       f[1]
                                              fib[1]
                                                        1
                     0012FF7C
                                       f[2]
                                              fib[2]
                                                        2
              5
 n
      num
                                              fib[3]
                                       f[3]
                                                        3
                           0012FF0C
              i
                                       f[4]
                                              fib[4]
                                                        5
                void fibonacci (int &n, int *&f)
                   cin >> n;
                   f = new int[n];
                   f[0] = 1:
                   f[1] = 1;
                   for (int i = 2; i < n; i++)
                      f[i] = f[i - 2] + f[i - 1];
int main()
   int num = 0;
   int *fib = nullptr;
   fibonacci ( num, fib );
   for (int i = 0; i < num; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

00491D94

00491D98

00491D9C

```
fib[0]
                                                        00491D90
                                                    1
     00491D90 0012FF78
fib
                                          fib[1]
                                                        00491D94
                                                    1
               0012FF7C
                                          fib[2]
                                                    2
                                                        00491D98
         5
num
                                          fib[3]
                                                    3
                                                        00491D9C
                                          fib[4]
                                                    5
                                                        00491DA0
```

```
void fibonacci (int &n, int *&f)
                   cin >> n;
                   f = new int[n];
                   f[0] = 1;
                   f[1] = 1;
                   for (int i = 2; i < n; i++)
                      f[i] = f[i - 2] + f[i - 1];
int main()
   int num = 0;
   int *fib = nullptr;
   fibonacci ( num, fib );
   for (int i = 0; i < num; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fib;
```

```
fib 00491D90 0012FF78
num 5 0012FF7C
```

```
void fibonacci (int &n, int *&f)
                    cin >> n;
                    f = new int[n];
                    \mathbf{f}[0] = 1;
                    f[1] = 1;
                    for( int i = 2; i < n; i++)
                       f[i] = f[i - 2] + f[i - 1];
int main()
   int num = 0;
   int *fib = nullptr;
   fibonacci ( num, fib );
   for (int i = 0; i < num; i++)
      cout << fib[ i ] << endl;</pre>
   del ete[] fi b;
```

Dynamically allocate a two dimensional array

```
int main()
   const int n = 4;
   int m;
   cout << "Enter a positive integer: ";</pre>
   cin \gg m;
   int ( *a )[ n ];
   a = new int[m][n]();
   a[0][2] = 2;
   cout << "a[0][2] = " << a[0][2] << endl;
   del ete[] a;
```

a 0012FF3C

```
int main()
{
    const int n = 4;
    int m;
    cin >> m;

    int (*a)[n];
    a = new int[m][n]();

    a[0][2] = 2;

    delete[] a;
}
```

```
0012FF40
                                       a[0][0]
                                       a[0][1]
                                                    0012FF44
                                                 0
                                       a[0][2]
                                                    0012FF48
                                                 0
              0012FF40 0012FF3C
                                                    0012FF4C
                                       a[0][3]
                                                 0
                                       a[1][0]
                                                    0012FF50
                                                 0
                                                    0012FF54
                                       a[1][1]
                                                 0
int main()
                                       a[1][2]
                                                    0012FF58
                                                 0
                                       a[1][3]
                                                    0012FF5C
                                                 0
   const int n = 4;
                                       a[2][0]
                                                    0012FF60
   int m;
                                                 0
   cin \gg m;
                                       a[2][1]
                                                 0
                                                    0012FF64
                                                    0012FF68
                                       a[2][2]
   int ( *a )[ n ];
                                                 0
   a = new int[m][n]();
                                       a[2][3]
                                                 0
                                                    0012FF6C
   a[0][2] = 2;
   del ete[] a;
}
```

```
0012FF40
                                       a[0][0]
                                       a[0][1]
                                                    0012FF44
                                                 0
                                       a[0][2]
                                                    0012FF48
              0012FF40 0012FF3C
                                                    0012FF4C
                                       a[0][3]
                                                 0
                                       a[1][0]
                                                    0012FF50
                                                 0
                                                    0012FF54
                                       a[1][1]
                                                 0
int main()
                                       a[1][2]
                                                    0012FF58
                                                 0
                                       a[1][3]
                                                    0012FF5C
                                                 0
   const int n = 4;
                                       a[2][0]
                                                    0012FF60
   int m;
                                                 0
   cin >> m;
                                       a[2][1]
                                                 0
                                                    0012FF64
                                                    0012FF68
                                       a[2][2]
   int ( *a )[ n ];
                                                 0
   a = new int[m][n]();
                                       a[2][3]
                                                 0
                                                    0012FF6C
   a[0][2] = 2;
   del ete[] a;
}
```

a 0012FF40 0012FF3C

```
int main()
{
    const int n = 4;
    int m;
    cin >> m;

    int (*a)[n];
    a = new int[m][n]();

    a[0][2] = 2;

    delete[] a;
}
```

```
      a[0]
      0
      0012FF40

      a[1]
      0
      0012FF44

      a[0]
      0
      0012FF44

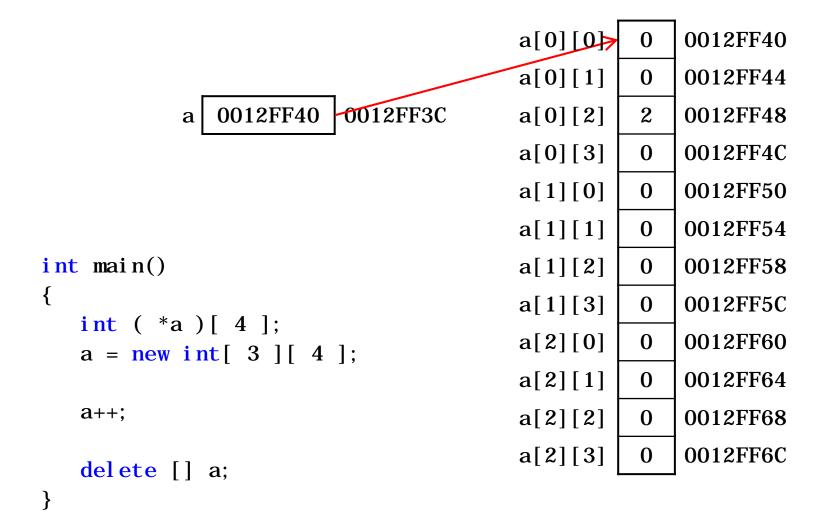
      a[1]
      0
      0012FF48

      a[3]
      0
      0012FF7C
```

```
int main()
{
   int *a;
   a = new int[ 4 ];
   a++;
   delete [] a;
}
```

```
a[0] 0 0012FF40
a[1] 0 0012FF44
a 0012FF44 0012FF3C a[2] 2 0012FF48
a[3] 0 0012FF7C
```

```
int main()
{
   int *a;
   a = new int[ 4 ];
   a++;
   delete [] a;
}
```

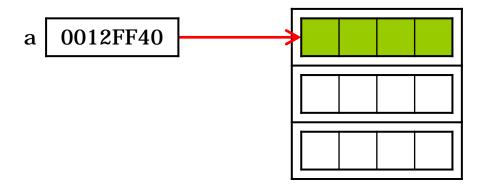


```
0012FF40
                                       a[0][0]
                                       a[0][1]
                                                     0012FF44
                                                 0
              0012FF50 0012FF3C
                                                     0012FF48
                                       a[0][2]
                                                 2
                                       a[0][3]
                                                     0012FF4C
                                                 0
                                       a[1][0]
                                                     0012FF50
                                                 0
                                                     0012FF54
                                       a[1][1]
                                                 0
int main()
                                       a[1][2]
                                                     0012FF58
                                                 0
{
                                                     0012FF5C
                                       a[1][3]
                                                 0
   int ( *a )[ 4 ];
                                                     0012FF60
                                       a[2][0]
                                                 0
   a = new int[3][4];
                                                     0012FF64
                                       a[2][1]
                                                 0
   a++;
                                                     0012FF68
                                       a[2][2]
                                                 0
                                       a[2][3]
                                                     0012FF6C
                                                 0
   del ete [] a;
}
```

```
a 0012FF40 ----
```

```
int *a;
a = new int[ 4 ];
a++;
```

Pointer



```
int ( *a )[ 4 ];
a = new int[ 3 ][ 4 ];
a++;
```

Pointer to array

```
a 0012FF44
```

```
int *a;
a = new int[ 4 ];
a++;
```

Pointer

```
a 0012FF50
```

```
int ( *a )[ 4 ];
a = new int[ 3 ][ 4 ];
a++;
```

Pointer to array

Passing dynamically allocated two dimensional arrays to functions

```
const int n = 4;
voi d fun( int ( *p )[ n ] );
int main()
{
   int m;
   cout << "Enter a positive integer: ";</pre>
   cin >> m;
   int ( *a )[ n ];
   a = new int[m][n]();
   fun(a);
   cout << "a[ 0 ][ 2 ] = " << a[ 0 ][ 2 ] << endl;
   del ete[] a;
}
void fun( int ( *p )[ n ] )
  p[0][2] = 2;
```

```
a 0012FF3C
```

```
const int n = 4;
voi d fun( int ( *p )[ n ] );
int main()
{
   int m;
   cin >> m;
  int ( *a )[ n ];
   a = new int[m][n]();
   fun( a );
   del ete[] a;
}
void fun( int ( *p )[ n ] )
  p[0][2] = 2;
```

```
a 0012FF3C
```

```
const int n = 4;
voi d fun( int ( *p )[ n ] );
int main()
{
   int m;
   cin >> m;
   int ( *a )[ n ];
   a = new int[m][n]();
   fun( a );
   del ete[] a;
}
voi d fun( int ( *p )[ n ] )
   p[0][2] = 2;
}
```

```
a[0][0]
                                                         0012FF40
                                                     0
       0012FF40
                 0012FF3C
                                                         0012FF44
                                           a[0][1]
                                                     0
                                           a[0][2]
                                                         0012FF48
                                                     0
                                           a[0][3]
                                                         0012FF4C
                                                     0
const int n = 4;
                                           a[1][0]
                                                         0012FF50
                                                     0
voi d fun( int ( *p )[ n ] );
                                                         0012FF54
                                           a[1][1]
                                                     0
int main()
                                                         0012FF58
                                           a[1][2]
                                                     0
                                           a[1][3]
                                                         0012FF5C
   int m;
                                                     0
   cin >> m;
                                           a[2][0]
                                                         0012FF60
                                                     0
   int ( *a )[ n ];
                                           a[2][1]
                                                     0
                                                         0012FF64
   a = new int[m][n]();
                                                         0012FF68
                                           a[2][2]
                                                     0
   fun(a);
                                           a[2][3]
                                                     0
                                                         0012FF6C
   del ete[] a;
}
void fun( int ( *p )[ n ] )
   p[0][2] = 2;
}
```

```
p[0][0] = a[0][0]
                                                         0012FF40
                                                      0
        0012FF40
                  -0012FF3C
                                  p[0][1]
                                            a[0][1]
                                                         0012FF44
                                                      0
                 0012FF38
        0012FF40
                                  p[0][2]
                                            a[0][2]
                                                         0012FF48
                                                      0
                                  p[0][3]
                                            a[0][3]
                                                         0012FF4C
                                                      0
const int n = 4;
                                  p[1][0]
                                            a[1][0]
                                                         0012FF50
                                                      0
voi d fun( int ( *p )[ n ] );
                                                         0012FF54
                                  p[1][1]
                                            a[1][1]
                                                      0
int main()
                                                         0012FF58
                                  p[1][2]
                                            a[1][2]
                                                      0
                                            a[1][3]
   int m;
                                  p[1][3]
                                                      0
                                                         0012FF5C
   cin \gg m;
                                  p[2][0]
                                            a[2][0]
                                                         0012FF60
   int ( *a ) [ n ];
                                  p[2][1]
                                            a[2][1]
                                                         0012FF64
                                                      0
   a = new int[m][n]();
                                                         0012FF68
                                  p[2][2]
                                            a[2][2]
                                                      0
   fun(a);
                                  p[2][3]
                                            a[2][3]
                                                         0012FF6C
                                                      0
   del ete[] a;
}
void fun( int ( *p )[ n ] )
   p[0][2] = 2;
}
```

```
p[0][0] = a[0][0]
                                                         0012FF40
                                                      0
        0012FF40
                  -0012FF3C
                                  p[0][1]
                                            a[0][1]
                                                         0012FF44
                                                      0
                 0012FF38
        0012FF40
                                  p[0][2]
                                            a[0][2]
                                                      2
                                                         0012FF48
                                  p[0][3]
                                            a[0][3]
                                                         0012FF4C
                                                      0
const int n = 4;
                                  p[1][0]
                                            a[1][0]
                                                         0012FF50
                                                      0
voi d fun( int ( *p )[ n ] );
                                                         0012FF54
                                  p[1][1]
                                            a[1][1]
                                                      0
int main()
                                                         0012FF58
                                  p[1][2]
                                            a[1][2]
                                                      0
                                            a[1][3]
   int m;
                                  p[1][3]
                                                      0
                                                         0012FF5C
   cin \gg m;
                                  p[2][0]
                                            a[2][0]
                                                         0012FF60
   int ( *a ) [ n ];
                                  p[2][1]
                                            a[2][1]
                                                         0012FF64
                                                      0
   a = new int[m][n]();
                                                         0012FF68
                                  p[2][2]
                                            a[2][2]
                                                      0
   fun(a);
                                  p[2][3]
                                            a[2][3]
                                                         0012FF6C
                                                      0
   del ete[] a;
}
void fun( int ( *p )[ n ] )
   p[0][2] = 2;
}
```

```
a[0][0]
                                                         0012FF40
                                                     0
       0012FF40
                 0012FF3C
                                                         0012FF44
                                           a[0][1]
                                                     0
                                           a[0][2]
                                                     2
                                                         0012FF48
                                           a[0][3]
                                                         0012FF4C
                                                     0
const int n = 4;
                                            a[1][0]
                                                         0012FF50
                                                     0
voi d fun( int ( *p )[ n ] );
                                                         0012FF54
                                            a[1][1]
                                                     0
int main()
                                                         0012FF58
                                           a[1][2]
                                                     0
                                           a[1][3]
                                                         0012FF5C
   int m;
                                                     0
   cin >> m;
                                           a[2][0]
                                                         0012FF60
                                                     0
   int ( *a )[ n ];
                                           a[2][1]
                                                     0
                                                         0012FF64
   a = new int[m][n]();
                                                         0012FF68
                                           a[2][2]
                                                     0
   fun(a);
                                           a[2][3]
                                                     0
                                                         0012FF6C
   del ete[] a;
}
void fun( int ( *p )[ n ] )
   p[0][2] = 2;
}
```

```
a 0012FF40 0012FF3C
```

```
const int n = 4;
voi d fun( int ( *p )[ n ] );
int main()
{
   int m;
   cin >> m;
  int ( *a )[ n ];
   a = new int[m][n]();
   fun( a );
   del ete[] a;
}
void fun( int ( *p )[ n ] )
  p[0][2] = 2;
}
```

Dynamically allocate an array of arrays

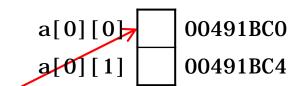
```
int main()
  int n;
   cout << "Enter a positive integer: ";</pre>
   cin >> n;
   int **a = new int*[ n ];
   for( int i = 0; i < n; i++)
      a[i] = new int[i + 2];
   a[1][1] = 3;
   for (int i = 0; i < n; i++)
      del ete[] a[ i ];
   del ete[] a;
```

```
a
```

0012FF70

```
int main()
{
   int n = 4;
   int **a = new int*[ n ];
   for( int i = 0; i < n; i++ )
       a[ i ] = new int[ i + 2 ];
   a[ 1 ][ 1 ] = 3;
   for( int i = 0; i < n; i++ )
       delete[] a[ i ];
   delete[] a;
}</pre>
```

```
00491850 | <del>0012</del>FF70
                        a[0]
                                         00491850
                        a[1]
                                         00491854
                                         00491858
                        a[2]
                        a[3]
                                         0049185C
    int main()
    {
       int n = 4;
       int **a = new int*[ n ];
       for( int i = 0; i < n; i++)
           a[ i ] = new int[ i + 2 ];
       a[1][1] = 3;
       for (int i = 0; i < n; i++)
          del ete[] a[ i ];
       del ete[] a;
    }
```



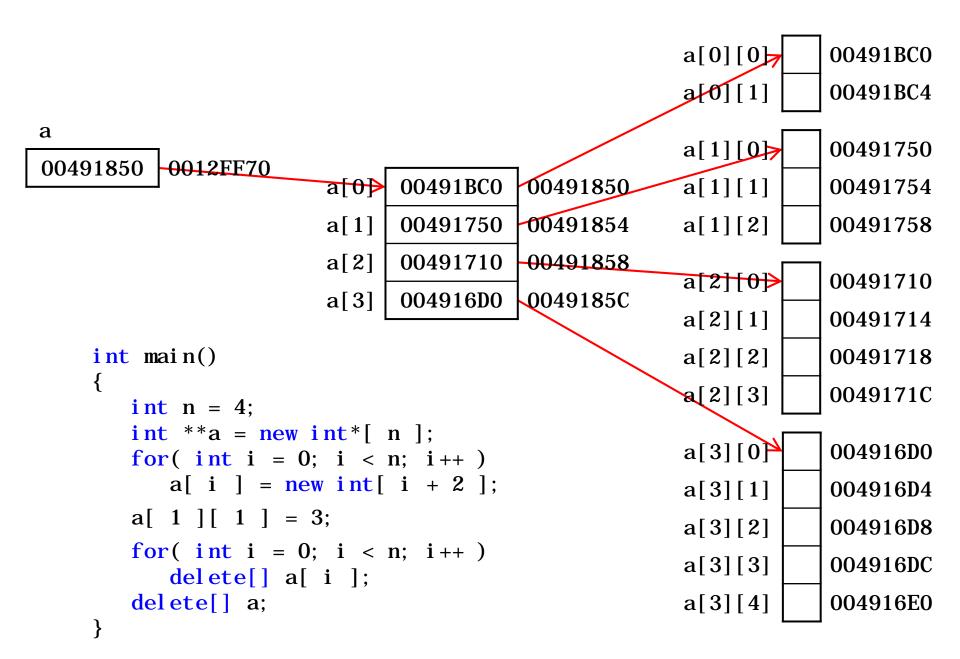
a

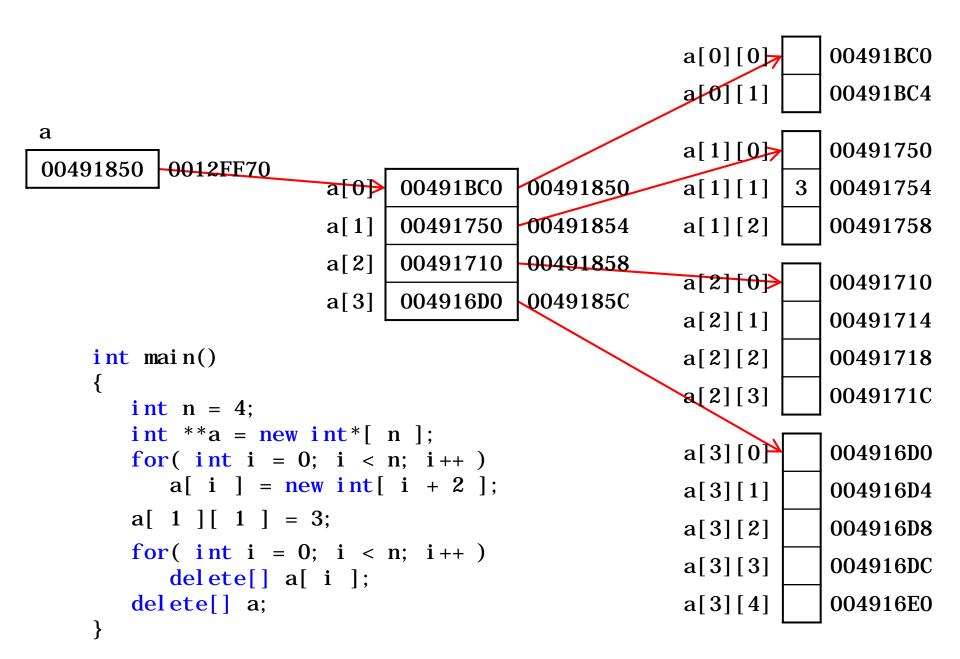
```
00491850 0012FF70 a[0] 00491BC0 00491850 a[1] 00491854 a[2] 00491858 a[3] 0049185C
```

```
int main()
{
   int n = 4;
   int **a = new int*[ n ];
   for( int i = 0; i < n; i++ )
      a[ i ] = new int[ i + 2 ];
   a[ 1 ][ 1 ] = 3;
   for( int i = 0; i < n; i++ )
      delete[] a[ i ];
   delete[] a;
}</pre>
```

```
a[0][0]
                                                                 00491BC0
                                                    a[0][1]
                                                                 00491BC4
a
                                                    a[1][0]
                                                                 00491750
00491850 | 0012FF70
                       a[0]
                             00491BC0
                                       00491850
                                                    a[1][1]
                                                                 00491754
                                       00491854
                                                                 00491758
                       a[1]
                             00491750
                                                    a[1][2]
                                        00491858
                       a[2]
                       a[3]
                                        0049185C
    int main()
    {
       int n = 4;
       int **a = new int*[ n ];
       for( int i = 0; i < n; i++)
          a[ i ] = new int[ i + 2 ];
       a[1][1] = 3;
       for( int i = 0; i < n; i++)
          del ete[] a[ i ];
       del ete[] a;
    }
```

```
a[0][0]
                                                                00491BC0
                                                    a[0][1]
                                                                00491BC4
a
                                                    a[1][0]
                                                                00491750
00491850 | 0012FF70
                       a[0]
                             00491BC0
                                       00491850
                                                    a[1][1]
                                                                00491754
                                      00491854
                       a[1]
                             00491750
                                                    a[1][2]
                                                                00491758
                       a[2]
                             00491710
                                       00491858
                                                    a[2][0]
                                                                00491710
                       a[3]
                                       0049185C
                                                    a[2][1]
                                                                00491714
    int main()
                                                    a[2][2]
                                                                00491718
    {
                                                                0049171C
                                                    a[2][3]
       int n = 4;
       int **a = new int*[n];
       for( int i = 0; i < n; i++)
          a[i] = new int[i + 2];
       a[1][1] = 3;
       for( int i = 0; i < n; i++)
          del ete[] a[ i ];
       del ete[] a;
    }
```





```
a
                                                    a[1][0]
                                                                00491750
00491850
         -0012FF70
                             00491BC0
                                       00491850
                                                    a[1][1]
                                                             3
                       a[0]
                                                                00491754
                                                                00491758
                                      00491854
                       a[1]
                             00491750
                                                    a[1][2]
                       a[2]
                             00491710
                                      00491858
                                                    a[2][0]
                                                                00491710
                       a[3]
                             004916D0
                                       0049185C
                                                    a[2][1]
                                                                00491714
    int main()
                                                    a[2][2]
                                                                00491718
    {
                                                    a[2][3]
                                                                0049171C
       int n = 4;
       int **a = new int*[n];
                                                                004916D0
                                                    a[3][0]
       for( int i = 0; i < n; i++)
          a[i] = new int[i + 2];
                                                    a[3][1]
                                                                004916D4
       a[1][1] = 3:
                                                    a[3][2]
                                                                004916D8
       for( int i = 0; i < n; i++)
                                                                004916DC
                                                    a[3][3]
          del ete[] a[ i ];
                                                                004916E0
       delete[] a;
                                                    a[3][4]
```

```
a
```

```
00491850 | 0012FF70
                             00491BC0
                                       00491850
                       a[0]
                       a[1]
                             00491750
                                       00491854
                       a[2]
                             00491710
                                       00491858
                                                                00491710
                                                    a[2][0]>
                       a[3]
                             004916D0
                                       0049185C
                                                    a[2][1]
                                                                00491714
    int main()
                                                    a[2][2]
                                                                00491718
    {
                                                    a[2][3]
                                                                0049171C
       int n = 4;
       int **a = new int*[n];
                                                                004916D0
                                                    a[3][0]
       for( int i = 0; i < n; i++)
          a[i] = new int[i + 2];
                                                    a[3][1]
                                                                004916D4
       a[1][1] = 3;
                                                    a[3][2]
                                                                004916D8
       for( int i = 0; i < n; i++)
                                                                004916DC
                                                    a[3][3]
          del ete[] a[ i ];
       del ete[] a;
                                                                004916E0
                                                    a[3][4]
```

```
a
O
```

```
00491850 | 0012FF70
                             00491BC0
                                       00491850
                       a[0]
                       a[1]
                             00491750
                                       00491854
                                       00491858
                       a[2]
                             00491710
                       a[3]
                             004916D0
                                       0049185C
    int main()
    {
       int n = 4;
       int **a = new int*[ n ];
                                                    a[3][0]
                                                                004916D0
       for( int i = 0; i < n; i++)
          a[i] = new int[i + 2];
                                                    a[3][1]
                                                                004916D4
       a[1][1] = 3;
                                                    a[3][2]
                                                                004916D8
       for( int i = 0; i < n; i ++)
                                                                004916DC
                                                    a[3][3]
          del ete[] a[ i ];
       del ete[] a;
                                                                004916E0
                                                    a[3][4]
    }
```

```
a
```

```
00491850 | 0012FF70
                       a[0]
                             00491BC0
                                       00491850
                       a[1]
                             00491750
                                       00491854
                                       00491858
                       a[2]
                             00491710
                       a[3]
                             004916D0
                                       0049185C
    int main()
    {
       int n = 4;
       int **a = new int*[ n ];
       for( int i = 0; i < n; i++)
          a[ i ] = new int[ i + 2 ];
       a[1][1] = 3;
       for (int i = 0; i < n; i++)
          del ete[] a[ i ];
       del ete[] a;
    }
```

00491850 | 0012FF70

```
int main()
{
  int n = 4;
  int **a = new int*[ n ];
   for( int i = 0; i < n; i++)
      a[i] = new int[i + 2];
   a[1][1] = 3;
   for (int i = 0; i < n; i++)
     del ete[] a[ i ];
   del ete[] a;
}
```

Passing dynamically allocated array of arrays to functions

```
int main()
  int n;
   cout << "Enter a positive integer: ";</pre>
   cin >> n;
   int **a = new int*[n];
   for (int i = 0; i < n; i++)
      a[i] = new int[i + 2];
   fun( a, n );
   for (int i = 0; i < n; i++)
      del ete [] a[ i ];
   del ete [] a;
void fun( int **p, int n )
  p[1][1] = 3;
```

```
void fun( int **p, int n )
{
      p[ 1 ][ 1 ] = 3;
}
a
0012FF70
```

```
int main()
{
   int n = 4;
   int **a = new int*[ n ];
   for( int i = 0; i < n; i++ )
      a[ i ] = new int[ i + 2 ];
   fun( a, n );
   for( int i = 0; i < n; i++ )
      delete [] a[ i ];
   delete [] a;
}</pre>
```

```
void fun( int **p, int n )
       {
          p[1][1] = 3;
a
00491850 | 0012FF70
                      a[0]
                                      00491850
                      a[1]
                                      00491854
                      a[2]
                                      00491858
                      a[3]
                                      0049185C
 int main()
 {
    int n = 4;
    int **a = new int*[ n ];
    for( int i = 0; i < n; i++)
       a[ i ] = new int[ i + 2 ];
    fun( a, n );
    for( int i = 0; i < n; i ++)
       del ete [] a[ i ];
    del ete [] a;
 }
```

```
a[0][0]
       void fun( int **p, int n )
                                                               00491BC0
       {
                                                   a[0][1]
                                                               00491BC4
          p[1][1] = 3;
a
00491850 | 0012FF70
                            00491BC0
                                     00491850
                     a[0]
                     a[1]
                                      00491854
                     a[2]
                                      00491858
                     a[3]
                                      0049185C
 int main()
 {
    int n = 4;
    int **a = new int*[ n ];
    for( int i = 0; i < n; i++)
       a[ i ] = new int[ i + 2 ];
    fun( a, n );
    for (int i = 0; i < n; i++)
       del ete [] a[ i ];
    del ete [] a;
 }
```

```
a[0][0]
                                                               00491BC0
       void fun( int **p, int n )
       {
                                                   a[0][1]
                                                               00491BC4
          p[1][1] = 3;
a
                                                   a[1][0]
                                                               00491750
00491850 | 0012FF70
                                                   a[1][1]
                                                               00491754
                           00491BC0
                                     00491850
                     a 0
                                                   a[1][2]
                                                               00491758
                           00491750
                                     00491854
                     a[1]
                     a[2]
                                      00491858
                     a[3]
                                      0049185C
 int main()
 {
    int n = 4;
    int **a = new int*[ n ];
    for( int i = 0; i < n; i++)
       a[ i ] = new int[ i + 2 ];
    fun( a, n );
    for (int i = 0; i < n; i++)
       delete [] a[ i ];
    del ete [] a;
 }
```

```
00491BC0
       void fun( int **p, int n )
                                                  a[0][0]
       {
                                                  a[0][1]
                                                              00491BC4
          p[1][1] = 3;
a
                                                  a[1][0]
                                                              00491750
00491850 | 0012FF70
                                                  a[1][1]
                                                              00491754
                           00491BC0
                                     00491850
                     a 0
                                                  a[1][2]
                                                              00491758
                           00491750
                                     00491854
                     a[1]
                           00491710
                                     00491858
                     a[2]
                                                              00491710
                                                  a[2][0]
                                     0049185C
                     a[3]
                                                  a[2][1]
                                                              00491714
 int main()
                                                  a[2][2]
                                                              00491718
 {
    int n = 4;
                                                  a[2][3]
                                                              0049171C
    int **a = new int*[n];
    for( int i = 0; i < n; i++)
       a[i] = new int[i + 2];
    fun( a, n );
    for (int i = 0; i < n; i++)
       delete [] a[ i ];
    del ete [] a;
 }
```

```
a[0][0]
                                                              00491BC0
       void fun( int **p, int n )
                                                   a[0][1]
                                                              00491BC4
          p[1][1] = 3;
a
                                                   a[1][0]
                                                              00491750
00491850 | 0012FF70
                                                   a[1][1]
                                                              00491754
                                     00491850
                           00491BC0
                     a 0
                                                              00491758
                                                   a[1][2]
                     a[1]
                           00491750
                                     00491854
                                     00491858
                     a[2]
                           00491710
                                                              00491710
                                                   a[2][0]
                                     0049185C
                     a[3]
                           004916D0
                                                   a[2][1]
                                                              00491714
 int main()
                                                   a[2][2]
                                                              00491718
 {
    int n = 4;
                                                   a[2][3]
                                                              0049171C
    int **a = new int*[ n ];
    for( int i = 0; i < n; i++)
       a[i] = new int[i + 2];
                                                              004916D0
                                                   a[3][0]
    fun( a, n );
                                                   a[3][1]
                                                              004916D4
    for (int i = 0; i < n; i++)
                                                   a[3][2]
                                                              004916D8
       delete [] a[ i ];
                                                              004916DC
    del ete [] a;
                                                   a[3][3]
 }
                                                              004916E0
                                                   a[3][4]
```

```
p[0][0] a[0][0]
                                                              00491BC0
       void fun( int **p, int n )
                                                  a[0][1]
                                                              00491BC4
                                         p[0][1]
          p[1][1] = 3;
a
                                         p[1][0]
                                                  a[1][0]
                                                              00491750
00491850
         0012FF70
                                                  a[1][1]
                                                              00491754
                           00491BC0
                                     00491850
               p[0]
                     a[0]
                                                              00491758
                                                  a[1][2]
         0012FF10
                                     00491854
00491850
                     a[1]
                           00491750
                                     00491858
               p[2]
                     a[2]
                           00491710
p
                                                              00491710
                                                  a[2][0]
                                     0049185C
                           004916D0
               p[3]
                     a[3]
                                                  a[2][1]
                                                              00491714
 int main()
                                         p[2][2]
                                                  a[2][2]
                                                              00491718
 {
    int n = 4;
                                         p[2][3] a[2][3]
                                                              0049171C
    int **a = new int*[n];
    for( int i = 0; i < n; i++)
       a[i] = new int[i + 2];
                                                              004916D0
                                         p[3][0]
                                                  a[3][0]
    fun( a, n );
                                                  a[3][1]
                                                              004916D4
                                         p[3][1]
    for( int i = 0; i < n; i++)
                                                              004916D8
                                         p[3][2]
                                                  a[3][2]
       delete [] a[ i ];
                                                              004916DC
    del ete [] a;
                                         p[3][3]
                                                  a[3][3]
 }
                                                              004916E0
                                         p[3][4]
                                                  a[3][4]
```

```
p[0][0] a[0][0]
                                                              00491BC0
       void fun( int **p, int n )
                                                  a[0][1]
                                                              00491BC4
                                         p[0][1]
          p[1][1] = 3;
a
                                         p[1][0]
                                                  a[1][0]
                                                              00491750
00491850
         0012FF70
                                                  a[1][1]
                                                              00491754
                           00491BC0
                                     00491850
               p[0]
                     a[0]
                                                              00491758
                                                  a[1][2]
         0012FF10
                                     00491854
00491850
                     a[1]
                           00491750
                                     00491858
               p[2]
                     a[2]
                           00491710
p
                                                              00491710
                                                  a[2][0]
                                     0049185C
                           004916D0
               p[3]
                     a[3]
                                                  a[2][1]
                                                              00491714
 int main()
                                         p[2][2]
                                                  a[2][2]
                                                              00491718
 {
    int n = 4;
                                         p[2][3] a[2][3]
                                                              0049171C
    int **a = new int*[n];
    for( int i = 0; i < n; i++)
       a[i] = new int[i + 2];
                                                              004916D0
                                         p[3][0]
                                                  a[3][0]
    fun( a, n );
                                                  a[3][1]
                                                              004916D4
                                         p[3][1]
    for( int i = 0; i < n; i++)
                                                  a[3][2]
                                                              004916D8
                                         p[3][2]
       delete [] a[ i ];
                                                              004916DC
    del ete [] a;
                                         p[3][3]
                                                  a[3][3]
 }
                                                              004916E0
                                         p[3][4]
                                                  a[3][4]
```

```
a[0][0]
                                                              00491BC0
       void fun( int **p, int n )
                                                   a[0][1]
                                                              00491BC4
          p[1][1] = 3;
a
                                                   a[1][0]
                                                              00491750
00491850 | 0012FF70
                                                   a[1][1]
                                                              00491754
                                     00491850
                           00491BC0
                     a 0
                                                              00491758
                                                   a[1][2]
                     a[1]
                           00491750
                                     00491854
                                     00491858
                     a[2]
                           00491710
                                                              00491710
                                                   a[2][0]
                                     0049185C
                     a[3]
                           004916D0
                                                   a[2][1]
                                                              00491714
 int main()
                                                   a[2][2]
                                                              00491718
 {
    int n = 4;
                                                   a[2][3]
                                                              0049171C
    int **a = new int*[ n ];
    for( int i = 0; i < n; i++)
       a[i] = new int[i + 2];
                                                              004916D0
                                                   a[3][0]
    fun( a, n );
                                                   a[3][1]
                                                              004916D4
    for (int i = 0; i < n; i++)
                                                   a[3][2]
                                                              004916D8
       delete [] a[ i ];
                                                              004916DC
    del ete [] a;
                                                   a[3][3]
 }
                                                              004916E0
                                                   a[3][4]
```

```
void fun( int **p, int n )
          p[1][1] = 3;
a
                                                              00491750
                                                   a[1][0]
00491850 | 0012FF70
                                                   a[1][1]
                                                              00491754
                                                           3
                                      00491850
                           00491BC0
                     a 0
                                                              00491758
                                                   a[1][2]
                     a[1]
                                     00491854
                           00491750
                     a[2]
                           00491710
                                     -00491858
                                                              00491710
                                                   a[2][0]
                                     0049185C
                     a[3]
                           004916D0
                                                   a[2][1]
                                                              00491714
 int main()
                                                   a[2][2]
                                                              00491718
 {
    int n = 4;
                                                   a[2][3]
                                                              0049171C
    int **a = new int*[n];
    for( int i = 0; i < n; i++)
       a[i] = new int[i + 2];
                                                              004916D0
                                                   a[3][0]
    fun( a, n );
                                                   a[3][1]
                                                              004916D4
    for( int i = 0; i < n; i++)
                                                              004916D8
                                                   a[3][2]
       delete [] a[ i ];
    del ete [] a;
                                                   a[3][3]
                                                              004916DC
 }
                                                              004916E0
                                                   a[3][4]
```

```
void fun( int **p, int n )
          p[1][1] = 3;
a
00491850 | 0012FF70
                     a 0
                           00491BC0
                                     00491850
                     a[1]
                           00491750
                                     00491854
                     a[2]
                           00491710
                                     00491858
                                                              00491710
                                                  a[2][0]
                                     0049185C
                     a[3]
                           004916D0
                                                  a[2][1]
                                                              00491714
 int main()
                                                  a[2][2]
                                                              00491718
 {
    int n = 4;
                                                  a[2][3]
                                                              0049171C
    int **a = new int*[n];
    for( int i = 0; i < n; i++)
       a[i] = new int[i + 2];
                                                              004916D0
                                                  a[3][0]
    fun( a, n );
                                                  a[3][1]
                                                              004916D4
    for( int i = 0; i < n; i++)
                                                              004916D8
                                                  a[3][2]
       delete [] a[ i ];
    del ete [] a;
                                                  a[3][3]
                                                              004916DC
 }
                                                  a[3][4]
                                                              004916E0
```

```
void fun( int **p, int n )
       {
          p[1][1] = 3;
a
00491850 | 0012FF70
                     a 0
                           00491BC0
                                     00491850
                     a[1]
                           00491750
                                      00491854
                                      00491858
                     a[2]
                           00491710
                                     0049185C
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                           004916D0
 int main()
 {
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    for( int i = 0; i < n; i++)
       a[i] = new int[i + 2];
                                                  a[3][0]
                                                              004916D0
    fun( a, n );
                                                  a[3][1]
                                                              004916D4
    for( int i = 0; i < n; i++)
                                                  a[3][2]
                                                              004916D8
       delete [] a[ i ];
                                                              004916DC
    del ete [] a;
                                                  a[3][3]
 }
                                                  a[3][4]
                                                              004916E0
```

```
void fun( int **p, int n )
       {
          p[1][1] = 3;
a
00491850 | 0012FF70
                     a[0]
                           00491BC0
                                      00491850
                           00491750
                                      00491854
                     a[1]
                           00491710
                                      00491858
                     a[2]
                     a[3]
                           004916D0
                                      0049185C
 int main()
 {
    int n = 4;
    int **a = new int*[ n ];
    for( int i = 0; i < n; i++)
       a[ i ] = new int[ i + 2 ];
    fun( a, n );
    for( int i = 0; i < n; i++)
       delete [] a[ i ];
    del ete [] a;
 }
```

```
void fun( int **p, int n )
{
      p[ 1 ][ 1 ] = 3;
}
a

00491850 0012FF70
```

```
int main()
{
   int n = 4;
   int **a = new int*[ n ];
   for( int i = 0; i < n; i++ )
      a[ i ] = new int[ i + 2 ];
   fun( a, n );
   for( int i = 0; i < n; i++ )
      delete [] a[ i ];
   delete [] a;
}</pre>
```